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ABSTRACT

This document on early characteristics of high and low achieving black children of low socioeconomic status is part of the ETS Head Start longitudinal study, Disadvantaged Children and Their First School Experiences. In the study reported here, intensive case studies were prepared for those study children who, on a 3rd-grade achievement test, were: (1) significantly above or below the average performance for children of similar ethnic or income status in basic reading and math skills; or (2) significantly deviant from the level predicted by their performance on a test of preacademic skills at age 4. It is suggested that the findings of this report are relevant to the current controversy regarding early identification and screening of preschool children. Intensive study of observer ratings and test performances obtained during the age period 31/2-5 should indicate the extent to which assessment of cognitive, perceptual, affective and social functioning in preschool low income black children can serve to: (1) identify, early, those areas of functioning needing remediation; (2) suggest individualized modes of treatment; and (3) suggest early indices of gifted functioning. Included in the document are chapters on the sample, data collection and processing procedures, results and discussion, summary and conclusions. Appendices include measures used in 1969-74 child test batteries and a summary of data collection activities. (Author/MS)

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DISADVANTAGED CHILDREN AND THEIR FIRST SCHOOL EXPERIENCES

ETS-Head Start Longitudinal Study

Notable Early Characteristics of High and Low Achieving Black Low-SES Children

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with

Melinda Boroson
Brent Bridgeman
Joyce Gant
Michaele Mikovsky

December 1976

EDUCATIONAL TESTING SERVICE
PRINCETON, NEW JERSEY

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and provided us new insights into understanding the complexity of the young child's development.

Virginia C. Shipman

Princeton, New Jersey
December 15, 1976

Chapter 1

INTRODUCTION

The ETS Longitudinal Study of Young Children and Their First School Experiences focuses on two basic questions: What are the components of early education that facilitate or interfere with the cognitive, personal, and social development of disadvantaged children? What are the environmental and background variables that moderate these effects, and how do these moderators produce their influence?

It is well established that children from low socioeconomic-status families generally do not achieve academically as well as middle-class children. While a number of researchers have related this finding to various aspects of the differing environments of lower- and middle-class children, there is considerably less evidence describing environmental factors associated with performance differences solely within an economically disadvantaged population. Data from third-grade children from the Longitudinal Study indeed confirm the existence of wide ranges in cognitive aptitude and academic achievement among children of relatively homogeneous SES. To further our understanding of development and contribute to the planning of environments to facilitate that development it is obviously of critical importance to discover the unique characteristics of children and their environments that do not fit the generalization that low social class equals low achievement.

Analysis to date of the massive amount of data collected has been focused on examining relationships among various large sets of information from particular domains. In these investigations an attempt has been made to examine the consistency of findings across several status categories

(i.e., child's sex and race, family socioeconomic status, and geographical location). But one of the frustrations experienced in doing large-scale research is the impersonal aspect of such group analysis and the consequent decreased awareness one has of individual study participants. Every so often one hears a tester's or teacher's salient comment about a particular child; in some instances a local agency or newspaper article reports a critical family event. But to a large extent the individual developmental histories of study children remain unknown to the researcher who, to operate efficiently and in accord with relevant statistical models, must constantly reduce the data collected into a limited set of variables.

Given the multiple and interacting nature of influences upon any behavior and the error contained in any measurement technique used, the magnitude of correlation obtained between psychosocial variables and the young child's functioning is understandably moderate at best, accounting for only a small amount of the behavior examined. Moreover, we do not know the extent to which various aspects of the child's development are appropriately assessed by statistical models that assume a linear growth model. The present study was an attempt to generate hypotheses concerning those combinations of factors which enhance or interfere with the child's early grade-school performance. Intensive case studies were prepared for those study children who, on a third-grade achievement test, were: 1) significantly above or below the average performance for children of similar ethnic and income status in basic school skills of reading and math or 2) significantly deviant from the level predicted by their performance on a test of pre-academic skills at age four.

It should be noted that such an approach is not seen as an alternative or substitute for previous analyses, but rather as a supplement to them. We recognize that the problems indicated above are not eliminated by this approach. However, an intensive study of extreme cases should serve to highlight significant factors (and/or combinations and sequences of factors), i.e., those environmental events or personal dispositions that covary with school performance. Thus, close examination of the preschool and primary grade programmatic information gathered should help delineate critical factors in the child's early school experiences. Of particular value is the opportunity such an approach provides for closer examination of the processes by which a child arrives at a given response and consequently his status on a particular test measure. Those factors/processes not identified previously in the larger sample can then serve as hypotheses to be tested in subsequent experimental studies.

The findings in this report should also be relevant to the current controversy regarding early identification and screening of preschool children. Intensive study of observer ratings and test performances obtained during the age period 3 1/2 to 5 should indicate the extent to which assessment of cognitive, perceptual, affective, and social functioning in preschool low-income black children, a group who in general can be classified as "at risk" with regard to functioning successfully in school, can serve to: 1) identify early those areas of functioning needing remediation and 2) suggest individualized modes of treatment. Equally important, the findings may suggest early indices of gifted functioning.

Thus, by multiple analytic strategies we hope to contribute to the further understanding of the complex interacting influences upon children's

development so as to provide a basis for informed socioeducational intervention.

In the next chapter, Sample, the total longitudinal sample and the methods used for selecting the subsample of children in the extreme groups described in this report are presented. In Chapter 3, Data Collection and Processing Procedures, measurement strategies for the five study years are summarized. The findings from a series of selected analytic comparisons and from the intensive case studies prepared are presented in Chapter 4, Results and Discussion. In Chapter 5, Summary and Conclusions, the findings are summarized and implications for future research and socioeducational policy discussed.

Chapter 2

SAMPLE

The sample for the current report is a subsample from the ETS-Head Start Longitudinal Study. Sample selection procedures and initial sample characteristics for the Longitudinal Study are presented in Project Report 71-19 (Shipman, 1971). Briefly, in the fall of 1968 four regionally distinct communities were selected which (1) had sufficient numbers of children in grade school and in the Head Start program, (2) appeared feasible for longitudinal study given expressed community and school cooperation and expected mobility rates, and (3) offered variation in preschool and primary grade experiences. The study sites chosen were Lee County, Alabama; Portland, Oregon; St. Louis, Missouri; and Trenton, New Jersey. Within these communities, elementary school districts with a substantial proportion of the population eligible for Head Start were selected. In each school district an attempt was made to test all non-physically handicapped, English-speaking children who were expected to enroll in first grade in the fall of 1971 (i.e., children of approximately 3 1/2 to 4 1/2 years of age).

In 1969 mothers were interviewed and children tested prior to their enrollment in Head Start or any other preschool program. For this initial four-site sample at least partial data were obtained on a total of 1875 children, with Lee County and Portland constituting 60% of the sample. Sixty-two percent of the sample was black, with boys comprising 53% of the overall sample, 54.5% of the black sample, and 50.5% of the white sample. For the three sites in which children had the opportunity to attend Head Start in the second year of the study (1969-1970), 37.2% of the sample attended Head Start, 11% attended other preschool programs, and 51.8% had no

known attendance in Head Start or other preschool programs. In Lee County, where Head Start was a kindergarten program, 41.7% of the initial sample attended Head Start, 19.1% attended other preschool programs, and 39.9% had no known attendance in Head Start or other preschool programs. While racial composition of the Head Start sample varied by site, substantially more blacks than whites attended Head Start; only 13.3% of the children enrolled were white. For a variety of reasons, the St. Louis site was dropped in the third year of the study and the 353 subjects there lost from further longitudinal study. By the end of the fourth year of the study in June 1972, the longitudinal sample consisted of 1086 children in three sites. In June of 1974, the six-year longitudinal sample contained 1017 children in three sites. Thus, except for the loss of St. Louis, attrition over six years was limited to about one-third of the original sample, with losses distributed equally across sexes and sites, but relatively greater for whites in each site. The six-year longitudinal sample went from 62% to 72% black across sites.

The current analysis focused on children from the longitudinal sample (i.e., those who were tested or their mother interviewed in Year 1[1]) who were below the 1969 Office of Economic Opportunity poverty guidelines as determined by the parent interview given during the year Head Start was available to study children. Since the number of white families in the

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[1]Throughout the report "Year" refers to year of the Longitudinal Study.
Year 1 = January to August 1969 (child age 3 1/2-4 1/2);
Year 2 = September 1969 to August 1970 (child age 4 1/2-5 1/2);
Year 3 = September 1970 to August 1971 (child age 5 1/2-6 1/2);
Year 4 = September 1971 to August 1972 (child age 6 1/2-7 1/2);
Year 5 = September 1972 to August 1973 (child age 7 1/2-8 1/2);
Year 6 = September 1973 to August 1974 (child age 8 1/2-9 1/2).

study meeting these criteria was relatively small, only black children were included to eliminate the possibility of racial confounding. Scores on the Year 6 Cooperative Primary Tests were necessary to define the extreme groups, which markedly reduced the size of the sample available for this analysis since achievement tests were administered only in target classrooms (i.e., classes with 50% or more study children who had been previously tested). Thus, the sample for the current report (henceforth referred to as the "total sample") consisted of black children from Head Start-eligible families who were identified in Year 1 and had scores available on the Year 6 Cooperative Primary Tests. The total sample consisted of 100 boys and 86 girls. From this economically disadvantaged sample the highest and lowest achieving children were selected by three different methods which will be discussed below. Although most children were identified by all three methods, some children satisfied the selection criteria for only one method.

The third-grade Reading and Math subtests of the Cooperative Primary Tests (Cooperative Test Division, ETS, 1967) served as the index of Year 6 achievement. The Cooperative Primary Tests are a nationally standardized achievement test battery developed by ETS and designed for use in grades one through three. The tests are group administered, with the child responding by making an "X" on the one of the three response alternatives s/he believes is correct. There is no special instruction to the student about guessing, and there is no correction for guessing in the scoring. The teacher is instructed to allow a reasonable amount of time for all students to finish. In order to provide practice with this type of item, the pilot test included in the test package was administered first. Both forms of the Reading test consist of 50 items, some of which assess the comprehension of individual

words, while others require the student to extract a key element from a sentence or paragraph, or provide some interpretation, evaluation, or inference based on the sentence or paragraph. The Math test consists of 60 items covering the following topics: number, symbolism, operation, function and relation, approximation, proof, measurement, estimation, and geometry. Straight computation is not emphasized, but rather an attempt is made "...to test major concepts of mathematics in their emergent state" (Cooperative Test Division, ETS, 1967). Form 23B of both Reading and Math was administered.

The first method selected children for the extreme groups on the basis of their raw scores in Reading and Math. The twenty-five highest and twenty-five lowest scoring black Head Start-eligible children, irrespective of sex, were identified separately for the two subtests. Each of the resultant groups thus contained approximately 14% of the total sample, and the means of the high and low groups were more than two standard deviations apart. Within this group the ten highest and lowest scoring boys and ten highest and lowest scoring girls were then identified. Table 1 presents the means and standard deviations on Reading and Math for the total black Head Start-eligible longitudinal sample and for groups identified by this method. These values can be compared to the national standardization sample for the Cooperative Primary Tests where the Reading mean was 36.1 with a standard deviation of 8.5 and the Math mean was 39.4 with a standard deviation of 9.0.

The second method selected black Head Start-eligible children whose performance was significantly better or worse than predicted from Year 1 scores on the Preschool Inventory (PSI) (ETS, 1970). The 64-item PSI was selected as the predictor because it is a highly reliable test of preschool achievement

Table 1

Means and Standard Deviations on Reading and Math for the Total Sample and Extreme Raw Score Groups

Group	n	M	SD
	Reading		
Total Sample	174	25.16	8.32
High-Combined Sexes	25	39.36	2.87
Low-Combined Sexes	25	13.80	1.83
High-Boys	10	39.10	2.77
Low-Boys	10	12.80	1.32
High-Girls	10	41.30	1.89
Low-Girls	10	14.00	2.11
	Math		
Total Sample	181	28.50	8.43
High-Combined Sexes	25	42.80	3.21
Low-Combined Sexes	25	16.68	2.81
High-Boys	10	44.30	3.61
Low-Boys	10	15.70	2.71
High-Girls	10	42.90	2.38
Low-Girls	10	16.60	3.17

and had the highest loading on the general information-processing factor defined in Year 1 (Shipman, 1971). Since age at time of testing was known to affect PSI scores, the scores were age-adjusted by regressing total scores on age at the date of testing. The age-corrected PSI scores were then used in standard least-squares regression equations to obtain a predicted score for each child in Reading and Math. Separate regression equations were used for boys and girls. For boys the correlation between Year 1 PSI and Year 6 Reading

scores was .36 (regression weight [b] = .29), while for girls the correlation was .45 (b = .39). The correlations between PSI and Math performance were .25 (b = .23) for boys and .35 (b = .29) for girls. Separately for Reading and Math, the difference between the actual and predicted scores for each child was computed, and for each subtest the ten boys and ten girls with the greatest positive difference scores were selected; similarly, the ten boys and ten girls with the greatest negative difference scores were identified. Due to regression to the mean, the highest (and lowest) predicted scores were substantially closer to the mean than the highest (and lowest) actual scores. Thus, most of the children selected by this deviation from prediction method also were selected by the first "absolute score" method.

To avoid apparent mislabeling for some children caused by the regression-to-the-mean effects of this second method, a third method was used which identified children whose initial PSI scores were one standard deviation above (or below) the average of the total sample and whose Year 6 Reading and Math scores were one standard deviation below (or above) the mean. Thus, these were the children showing the greatest change in achievement preformance. Since the mean PSI score was 23.25 with a standard deviation of 9.89, any child with a score of 13 or less was considered low on the PSI and any child with a score of 33 or more was considered high. By this criterion 15 boys and 7 girls, or about 12% of the sample, were defined as low while 10 boys and 15 girls (about 15% of the sample) were classified as high. The mean of the Reading scores was 25.16 with a standard deviation of 8.32; thus scores of 33 and above were considered high, while scores of 17 and below were considered low. For the Math scores (mean of 28.5 and standard deviation of 8.43), high scores were those of 37 and above, while low scores were 20 and below.

Table 2 presents the number of children within each sex classification as high, medium (within one standard deviation of the mean), and low by these criteria. The deviation sample resulting from this method of selection comprised those children in the low-high and high-low categories for each of the subject areas. The 10 children in this group--4 in Reading, 5 in Math, and one who was included in both the Reading and Math areas--were chosen for particularly intensive case study.

Table 2

Number of Boys and Girls with Extreme PSI Scores at Age 4
Classified by Third-Grade Reading and Math Scores

		Preschool Inventory	
		Low (≤ 13)	High (≥ 33)
Reading			
High (≥ 33)	Boys	2	3
	Girls	1	11
Middle	Boys	8	6
	Girls	3	3
Low (≤ 17)	Boys	5	1
	Girls	3	1
Math			
High (≥ 37)	Boys	3	4
	Girls	1	6
Middle	Boys	9	6
	Girls	3	7
Low (≤ 20)	Boys	3	0
	Girls	1	2

Chapter 3

DATA COLLECTION AND PROCESSING PROCEDURES

General Strategies

To achieve the broad goals of the study the measurement strategy required selection of a variety of measures that would help describe more adequately the complex interrelationships and structure of children's abilities and characteristics over time and permit determination of their interaction effects with particular preschool and primary grade programs. Measures encompassing objectives claimed by preschool and primary grade programs were included along with measures of development that social science holds as important for human functioning. Measures also were included that would help delineate basic cognitive, affective, and social processes and their courses of development. Tasks were selected to allow continuity of measurement across age periods, through the use of vertically equivalent forms over time, and multiple measurement of the same variable (within a context) across several age periods so that possible developmental shifts in expression could be monitored. Process rather than static variables were emphasized, especially those process variables involving parent-child and teacher-child interactions, such as modes of information-processing and reinforcement strategies. To the extent possible, measures were included which tapped functional characteristics or perceptual and cognitive styles affecting learning, such as individual differences in ways in which children approach a task, kinds of cues selected, strategies of organization, speed of decision and response, and persistence. Implicit throughout was the belief that only for the intermediate purpose of structural analysis

and derivation of measures within domains could one separate cognitive, perceptual, social, and affective domains or study the child without taking environment into account.

The six years of research with the longitudinal study sample have included a total of about twenty-five and a half hours of testing for each child, four and a half hours of interviews with each of their mothers, an hour and a half of observing each mother-child pair working together on tasks, and a physical examination for each child. In addition, there have been eighteen days of observing each Head Start class, and three days of observing kindergarten, first, second, and third-grade classes, two half-hour periods of watching each child during "free play" in preschool, about four hours of each Head Start, kindergarten, first, second, and third-grade teacher's time to supply information about herself and the children in her classes, an hour from each Head Start aide, more than an hour of each Head Start Center Director's and principal's time to describe the preschool centers and elementary schools in general, and many consultations with community agencies to obtain information about the environments in which the children live. Data also were collected during spring 1970 fr[illegible] all children and teachers (K-3rd grade) as well as from administrators in the target elementary schools as a source of baseline data against which to interpret longitudinal results. (See Appendix A for a list of measures used in the study.)

The major variables toward which these information-gathering efforts have been directed include: (a) The Family, both status and process variables, that is, those variables describing what the family is (e.g., ethnic membership, occupational level) and what it does (e.g., the mother's teaching styles with her child and her attitudes toward the schools and the learning

process); (b) The Teacher, including such things as background characteristics, attitudes, abilities, teaching goals; (c) The Classroom, both program components and teacher-child and peer relationships; (d) The School, physical characteristics and organization as well as relationships between teachers and administrative staff; and (e) The Community. The largest percentage of measures included, however, were those designed to tap several aspects of (f) The Child, e.g., health information and cognitive, perceptual-motor, affective, and social development.

Data Collection Procedures

Community support and participation were essential if meaningful, useful data were to be obtained. Community leaders and administrators were consulted, and written intents (not merely consents) to participate in the study were sent to ETS by both community agencies and local school boards. Field operations were organized around local staff who served as coordinators, interviewers, testers, and observers. For the first phase of data collection, household canvassing and parent interviews, ETS subcontracted with the New York City firm of Audits and Surveys (A&S) to locate eligible children and then complete a 90-minute ETS-prepared interview with each eligible child's mother or mother surrogate. The interviewers, all female and matched by race with respondents, were recruited from the local communities, with A&S staff responsible for both training and supervision. In subsequent years of the study, parent interviews were conducted in a similar manner except that ETS assumed the training and supervision responsibilities that had been subcontracted to A&S. During the child's Head Start year the mother was interviewed in the testing center; home interviews were again obtained when the child was nine years old.

During the first study year individual child tests and mother-child interaction tasks were administered by local women, most of whom were black housewives with limited work experience. While the usual educational credentials were not required, experience in working with young children was considered highly desirable, as was the ability to read well and speak with ease. After four to five weeks of training, final selection of testers was made by the project director and a senior member of the research team. Testing was monitored by the local coordinator and by ETS regional and Princeton office staffs. Training procedures were essentially identical in later years except that with increased experience the training period could be reduced to three weeks. In the early years of the study, test centers were located in churches or community recreation facilities, while in later years testing was done in rooms available in the individual schools or in mobile vans parked outside of the school. Each year, individual tests were grouped into two or more batteries, with each battery usually administered in a single session with a child. Each battery included measures representing the range of areas being assessed; the order of tests within batteries reflected consideration for the need to balance types of responses (active vs. passive, verbal vs. nonverbal), and to stimulate and sustain the child's interest. The sequence of tests within each battery and the average time required for administration of each individually administered task described in this report are presented in Appendix B.

In the second year of the study a variety of measures were used to assess the preschool experience of all children enrolled in Head Start or other preschool classes in the urban sites. Random time samples of individual children's behavior were collected throughout the year with PROSE, a structured

observational procedure. Also, an attempt was made to obtain personal-social ratings of these children in the late fall and spring. Two trained local women observed the child's behavior during "free play," and later resolved any discrepancies in their independent ratings in order to form a single consensus rating on each scale. Global Classroom Ratings describing teacher-child and peer interactions were similarly obtained, except that observations for this instrument were not limited to "free play" periods. Global Classroom Ratings and Teacher Questionnaires were obtained in target classrooms for each subsequent year of the Longitudinal Study, with a target classroom defined as any class containing 50% or more study children. In grades 1-3 the observer who made the Global Classroom Ratings also provided information for the Assessment of Classroom Programs Inventory. Also, in grades 1-3, each teacher in a target classroom was asked to rate study children and their classmates with the Schaefer Classroom Behavior Inventory and the Enhancement of Learning Inventory. The local site coordinator explained the procedures and each teacher received a small honorarium for completing the tasks.

In the primary grades several group-administered measures were obtained. First- and third-grade teachers in target classrooms were asked to obtain two Human Figure Drawings from the children in their classes. Group achievement tests were administered in the spring by the classroom teacher in target classrooms. The local coordinator explained the procedures for group testing and was available to assist the teacher as needed. Local ETS staff administered the Coopersmith Self-Esteem Inventory to all third-grade target classrooms to enhance the child's feeling of confidentiality in the information obtained. At the end of each school year attendance, standardized test, and report card information were obtained from each school for study children.

Due to budgetary constraints data collection was not always uniform across sites. The most intensive testing coincided with the year of children's attendance in Head Start programs in each site. Thus, testing was limited in Lee County in Year 2 and in Portland and Trenton in Year 3. In Years 4 and 6, Trenton was selected as the site for reduced testing because it contained the fewest longitudinal subjects. Classroom observation of individual children was necessarily limited to the urban sites in Year 2 and the funds available permitted individual classroom observations only once again in Year 4. Since for most children in Lee County this was not only their first experience as public school students, but as pupils in an integrated learning environment, it was decided to collect these data in that site. Tables summarizing data collection activities across years in each site are presented in Appendix C.

Data Processing

The data from all of the above measures were scored and coded at the item level by Princeton office staff, and all scoring and coding was double-checked. The coded data were keypunched and independently verified, after which the individual data tapes were edited for appropriate ID listing and for out-of-range and logical inconsistencies in coding. To facilitate analysis across different measures and time periods merge tapes for each study year were prepared which comprised all derived family and child scores from the separate task tapes. For more detailed description of data collection and processing procedures see Project Reports 72-18 (Shipman, 1972b) and 75-28 (Shipman, McKee, & Bridgeman, 1976).

Chapter 4

RESULTS AND DISCUSSION

After examining the complete case folders prepared for each study child identified as "exceptional" by at least one of the three selection methods described earlier, descriptive statistics pertaining to several major areas of hypothesized differences were obtained: 1) demographic characteristics, 2) school characteristics, 3) early home environment, and 4) early child competencies, styles, and attitudes. Subsequent to these analyses, intensive case study was focused on those children who changed most between age four and age nine in achievement performance. For each of these 10 children case summaries were prepared from the massive array of data collected.

Demographic Differences

In the initial organization of the data, the extent to which groups differed significantly according to major demographic classifications (i.e., geographic region, family structure, prior preschool enrollment, sex) was examined. For these analyses, 107 third-grade children comprised the central pool of "exceptional" children in the black Head Start-eligible longitudinal sample. Specifically, they were the 15 boys and 15 girls who were classified into one of the eight categories: highest or lowest absolute or deviation scorers in reading or math. (Fifteen rather than 10 children were included in each category to provide more reliable comparisons.) As noted earlier, there was considerable overlap within the high and low categories. For example, of the 15 highest "positive deviation" scorers in reading, 7 were also among the top absolute scorers in math; and of the 15 male lowest absolute scorers in math, 13 also were among the greatest "negative deviation" scorers. The distribution of sexes in this reduced sample, however, remained approximately equal, with 55 boys and 52 girls.

Fifty-four children in Lee County were in one of the exceptional categories: 27 boys and 27 girls. Approximately two-thirds (n = 35) were "low" scorers (either "absolute" or "deviation" or both.), 18 were "high", and one child, a female, scored high in one subject area and low in the other.

	Male	Female	Total
High Scorers	10	8	18
Low Scorers	17	18	35
	27	26	53

Given the high percentage of eligible children recruited into the Lee County Head Start program, it is not surprising that all of these exceptional children had attended Head Start. About half the children (n = 28) lived in a two-parent family; 25 lived in a single-parent family (a child falls into this category if he or she was under the care of only one parent in any single year of the study), and one child lived with foster parents. (This case is not included with the other two-parent families because the couple boarded children for the Welfare Department and there were other non-related foster children in the household. The family structure was conceivably quite different from that of the other intact families of the sample.) The family structure by score breakdown was as follows:

	Single-parent	Two-parent	Total
High Scorers	8	9	17
Low Scorers	17	18	35
	25	27	52

The child in the foster home scored high and the child who scored both high and low came from an intact home.

The exceptional child subsample of thirty children from Portland comprised 16 boys and 14 girls. Two-thirds (n = 20) were in the high scoring category. When divided by sex, the following results were obtained:

	Male	Female	Total
High Scorers	10	10	20
Low Scorers	6	4	10
	16	14	30

Almost all of the children had attended Head Start (n = 28); one child had attended another preschool program and one had no known preschool participation. (Both of these non-Head Start children were in the high-scoring group.) Twenty-three of the thirty children had lived in single-parent homes at least one year during the study.

	Single-parent	Two-parent	Total
High Scorers	16	4	20
Low Scorers	7	3	10
	23	7	30

Twenty-three of these 107 exceptional study children came from Trenton. Almost twice as many were in the high-scoring group (whether selected by the deviation or the absolute method) as were in the low-scoring group (14 vs. 8), while one child was in both the high and low groups in different subject areas. Of these 23 children, 12 were boys and 11 were girls. Results for the sex by score breakdown were as follows:

	Male	Female	Total
High Scorers	6	8	14
Low Scorers	6	2	8
	12	10	22

The remaining girl scored high in one area and low in the other. Approximately two-thirds of the Trenton group (n = 15) attended Head Start; the remainder had no known preschool experience. The preschool by score breakdown was as follows:

	Head Start	No Preschool	Total
High Scorers	7	7	14
Low Scorers	7	1	8
	14	8	22

The remaining Head Start child scored on both levels. More than two-thirds (n = 17) of the children came from single-parent families. The family structure by score matrix follows:

	Single-parent	Two-parent	Total
High Scorers	11	3	14
Low Scorers	6	2	8
	17	5	22

The child who scored both high and low came from an intact family.

The reader must be cautious, however, in making site comparisons on the basis of these descriptive statistics given the disproportionate numbers of children by site in each of the cells above. Of the total longitudinal sample of 186 black Head Start-eligible children nearly half the children lived in Lee County (n = 90), with 47 and 49 children residing in Portland and Trenton, respectively. There were 100 boys and 86 girls. The 23 exceptional children in Trenton represent 49% of the eligible Trenton sample, while in Lee County 60% were included and in Portland, 64%. Of the eligible children, 55% of the boys and 60% of the girls qualified as "exceptional" children.

Table 3 provides site statistics for the 15 boys and 15 girls selected as exceptional in each of the two absolute categories. Percentages based on

the total Head Start-eligible children in each site are provided in parenthesis. As can be seen, approximately the same number (but differing percentage) of "high" children lived in each site, with consistently higher and lower percentages of children coming from Portland and Lee County, respectively. Children in Lee County comprised the highest percentage of the "low" group, however, while Trenton tended to have the smallest representation.

Table 3

Number of Boys and Girls in Top and Bottom Achievement Categories According to Site

		Lee County	Portland	Trenton	Total
Reading: Boys	Highs	6(6.7)	6(12.8)	3(6.1)	15
	Lows	8(8.9)	5(10.6)	2(4.3)	15
Reading: Girls	Highs	4(4.4)	8(17.0)	3(6.1)	15
	Lows	11(12.2)	1(2.1)	3(6.1)	15
Math: Boys	Highs	5(5.6)	6(12.8)	4(8.2)	15
	Lows	12(13.3)	3(6.4)	0(0.0)	15
Math: Girls	Highs	6(6.7)	5(10.6)	4(8.2)	15
	Lows	11(12.2)	3(6.4)	1(2.0)	15

No consistent sex differences were evident when children were classified on the basis of absolute scores. However, as was noted in describing the sample selected on the basis of having changed most in their achievement performance (i.e., by the third method), on the basis of their PSI scores at age four, 15 boys and 7 girls were defined as "low" while 10 boys and 15 girls were classified as "high"; in third grade 9 vs. 7 and 8 vs. 12 had exceptionally low and high achievement scores, respectively. Of the six children who had improved most, four were boys. Since most of these children had attended preschool, the data suggest that those boys with limited preacademic skills may benefit most from early intervention programs in helping them adapt to later school demands. Consistent with previous research on low-income black students (Solomon, Hirsch,

Scheinfeld, & Jackson, 1972; Wasserman, 1972), absence of a father figure in the home was not associated with classification in the absolute or deviant "exceptional" child categories.

In Portland, 40 of the 47 black Head Start-eligible children (85%) had attended Head Start, while 93% of the "exceptional" children in Portland had attended Head Start. As reported earlier, all of the black Head Start-eligible children in the Lee County sample had attended Head Start. In the total Trenton black Head Start-eligible sample of 49, 30 children (or 61%) went to Head Start as compared to 15 (or 65%) in the "exceptional" Trenton group. Since both the high and low groups contained a substantial number of Head Start attendees, prior preschool enrollment per se did not differentiate reading and math performance in third grade. (As will be noted later, this gross categorization did differentiate those who did poorly when a more severe index of school failure was used--i.e., grade retention--indicating a higher percentage of black Head Start-eligible children who had not attended Head Start or any other preschool program retained in the first or second grade.) Subsequent examination of those children who later attended a Follow Through program, however, suggested that at least for girls continuation of a broad comprehensive program in the primary grades had significant positive impact; in both Portland and Trenton more girls who attended Follow Through were in the high absolute or deviation groups (9:1 and 5:3, respectively), although priority for such placement is given to those most economically and/or educationally disadvantaged. Since there was no Follow Through program in Lee County, this factor could not be examined in this site.

In summary, when examining the extent to which children were categorized as exceptional according to geographical region, family structure, sex, and preschool attendance, only consistent differences according to site were

evidenced. Such differences suggest initial sample differences in children and their families, differential school or other relevant environment experiences, or some complex interactions among these factors. Moreover, in addition to the disproportionate cells among sites as described in Chapter 2, the extent to which site differences reflect differences in geographical region, urbanness, preschool teacher certification, preschool program sponsor, or age of entry into preschool (all of which are confounded with site in this sample), or other unmeasured variables, is unknown. For those Head Start children who later attended a Follow Through program, the data suggested the positive impact of continued broad comprehensive services to the children and their families.

School Characteristics

The data were next examined for differences in children's preschool and primary grade experience in terms of teacher background characteristics (i.e., sex, age, educational level, teaching experience) and a number of *a priori* categories of classroom environments derived from the Global Classroom Ratings observation procedure and the School Inventory questionnaire. In none of the sites could teachers be consistently divided into "high achievement" and "low achievement" groups--i.e., those who taught high "deviation" or "absolute" children and those who taught low "deviation" or "absolute" children. In the overwhelming number of cases particular teachers had children from both high and low categories in their classes in any one year.

In the limited number of cases where a teacher had four or more children in either the high or low category, that teacher was classified an "exceptional" teacher and, for convenience, labeled either "high" or "low." There were seven such teachers, three "high" with one from Trenton and two from Portland and four "low" all from Lee County. As can be seen in the following table, "high"

and "low" teachers (all female) did not differ significantly in age, years of experience, or years of schooling, although there was a trend for "low" teachers to be younger and, in contrast to the "high" group, to have had no post-graduate training.

Table 4

Age, Educational Level, and Teaching Experience of "High" and "Low" Teachers

	Age	Years Education	Years Experience
"High" Teachers	32	16	1
	24	17	3
	27	17	4
"Low" Teachers	22	15	2 1/2
	?	16	6
	23	16	1
	22	16	1

From the Global Classroom Ratings, differences in extent of the teacher's cognitive-perceptual stimulation, encouragement of verbalization, use of feedback, use of positive vs. negative regulatory techniques, warmth, nature of appeal systems used (i.e., appeals to power and norms, feelings, or logical consequences), and extent to which s/he relied on a total group structure provided suggestive data, but these variables were not consistently distinguishing characteristics of these children's classes. Similarly, children's modal attentiveness, compliance, and involvement did not differentiate classrooms with children in the "high" or "low" categories, although there was a trend for more child aggression to be observed in "low" classrooms. The locus of causality for such behaviors, however, remains unknown, with reciprocal interactions probable.

Given the diversity of school practices in assigning children to classrooms and the individual sequences of children's school experiences, one would

be surprised to find significant associations for these variables at any one time period. These findings also are consistent with recent research findings (e.g., Stallings, 1975) which indicate that, for more accurate prediction, teacher-child interactions must be assessed at the individual child level. The classroom can be and usually is a very different experiental environment for different children, depending in part on factors such as background characteristics (i.e., sex, ethnicity, race, and socioeconomic status), level of basic academic skills and more general problem-solving abilities, affective and social orientations, cognitive styles, and presence of a handicapping condition.

Examination of selected school characteristics (e.g., class size, school size, percent of black students) also revealed no consistent differences. There was a trend, however, for schools with more "high" children to have more support staff; this may again reflect gains associated with Follow Through.

Early Home and Child Measures

Another approach used was to assess the extent to which measures of the child's home environment and test performance at age four predicted placement in the "high" and "low" absolute score categories at age nine. For the following analyses, the twenty-five highest scoring children on the third-grade Cooperative Primary Test in reading were assigned dummy codes of 1 while the twenty-five lowest scoring children were assigned 0. This dummy variable was then correlated with a number of Year 1 (age 3 1/2 to 4 1/2) scores representing responses to parent interview items frequently used to describe family status, situational, and process characteristics and to child tests assessing a range of cognitive, perceptual-motor, affective, and social behaviors to form a series of point-biserial correlations. The child

measures chosen were those for which satisfactory reliability coefficients had been obtained in Year 1 for black Head Start-eligible children and included scores defining the two orthogonal factors obtained in factor analysis of the Year 1 data (see Shipman, 1971). The magnitude of this correlation for a particular variable indicates the extent to which that variable differentiated children who were classified in the high or low extreme groups. A similar procedure was used for the highest and lowest scoring students on the third-grade Cooperative Primary Test in math. As noted earlier, these samples were overlapping since many children were high (or low) in both reading and math.

Means and standard deviations for the high and low groups in reading and math on economic status indicators from the Year 1 Parent Interview are presented in Table 5. Also in Table 5 are the point-biserial correlations indicating the difference between the high and low groups, plus, for comparison purposes, the means and standard deviations from the total Year 1 pool of black Head Start-eligible children (including those who could not be followed longitudinally).

A description of the Year 1 Parent Interview is available in Project Report 72-13 (Shipman, 1972a). Briefly, the occupation scores are on the Census Bureau scale from 0 = Professional to 9 = Laborer; an additional point (10 = Unemployed) was added to the scale. Note the reduced n for the "father's occupation" scale due to the large number of single-parent families. It is apparent that variation within the very restricted range of occupations represented in this Head Start-eligible sample was not related to the children's achievement. A similar lack of association was obtained for the approximately 500 black children in the total third-grade sample, in contrast to a moderately high correlation for white study families, indicating the different meaning of

Table 5

Family Economic Status Variables for the Highest and Lowest Scoring Children

Interview Score	Statistic	Year 1 Sample[a]	High Reading	Low Reading	r	High Math	Low Math	r
Mother Occupation	n	389	24	23		24	24	
	M	8.58	8.58	8.96	-.00	8.50	8.50	.00
	SD	2.24	2.10	1.46		1.98	1.91	
Father Occupation	n	201	11	10		8	13	
	M	6.95	7.45	6.90	.17	6.88	7.77	-.18
	SD	2.23	1.75	1.56		3.27	1.96	
Head-of-Household Occupation	n	393	24	23		24	25	
	M	7.83	7.88	8.00	-.03	8.08	8.04	.01
	SD	2.30	2.21	1.81		2.65	1.70	
Family Possessions (standard score)	n	400	24	24		23	25	
	M	-1.15	-.01	-1.79	.47**	-.95	-1.81	.26*
	SD	2.38	1.71	1.73		1.77	1.54	
Number of Rooms/Persons	n	401	24	24		24	25	
	M	.85	1.99	.62	.42**	1.09	.62	.36**
	SD	.47	.85	.29		.84	.28	

[a]Year 1 sample refers to all black Head Start-eligible children tested in Year 1.

*$p < .05$, one-tailed
**$p < .01$, one-tailed

this variable for the two groups (cf. Stricker, 1976). However, despite the restricted range of economic conditions, a standard score based on the number of family possessions (car, radio, TV, etc.) and a score indicating crowding (i.e., the ratio of number of rooms to number of people in the household) were both significant in discriminating children who by third grade performed relatively well or poorly in reading and math.

As can be seen in Table 6 which describes other family characteristics, level of maternal education was significantly higher in both the reading and

Table 6

Selected Family Status and Process Variables for the Highest and Lowest Scoring Children

Interview Score	Statistic	Year 1 Sample[a]	High Reading	Low Reading	r	High Math	Low Math	r
Mother Education	n	404	24	24		24	25	
	M	9.69	10.88	8.71	.43**	10.38	8.76	.45**
	SD	2.37	2.19	2.48		1.97	2.45	
Father Education	n	220	11	13		8	17	
	M	8.80	9.64	6.85	.53**	8.63	7.82	.15
	SD	3.30	2.84	1.82		2.20	2.65	
Father Absence (1 = present; 0 = absent)	n	395	23	23		23	25	
	M	.43	.35	.48	-.13	.17	.36	-.21
	SD	.50	.49	.51		.39	.49	
Educational Aspiration	n	401	22	24		22	25	
	M	13.47	14.18	12.92	.33*	13.91	13.04	.22
	SD	2.07	2.04	1.67		2.18	1.74	
Educational Expectation	n	349	20	20		20	24	
	M	11.58	12.40	10.70	.50**	12.25	11.63	.17
	SD	1.77	1.54	1.49		1.94	1.76	
Frequency of Maternal Reading to Child	n	392	24	24		22	23	
	M	1.73	2.13	1.42	.26*	2.00	1.78	.08
	SD	1.36	1.91	1.53		1.38	1.41	
Number of Groups to Which Mother Belongs	n	405	24	24		24	25	
	M	.91	.92	.88	.02	1.00	1.12	-.06
	SD	1.11	1.14	.99		1.02	.89	

[a]Year 1 sample refers to all black Head Start-eligible children tested in Year 1.

*$p < .05$, one-tailed
**$p < .01$, one-tailed

math "high" groups, with mothers of children in the high reading group averaging two more years of education than mothers of children in the low group. The same general pattern occurred for level of father's education (within the reduced father-present sample) with a difference of nearly three years between

the high and low reading groups. Findings from the total study sample (Shipman et al., 1976) suggest the many associated attitudes and behaviors that may act as mechanisms for direct and indirect effects of parental education on the child's academic achievement (e.g., frequency of newspaper and magazine reading, use of alternatives to physical punishment for the child's misbehaviors, use of informative-interactive techniques in response to the child's questions, knowledge and use of community resources). As noted earlier in the description of demographic characteristics, fathers were present in fewer than half of the families in any of the extreme groups; father absence did not significantly discriminate high and low groups. Mother's educational aspirations ("What grade in school would you like your child to complete?") and educational expectations ("How far do you think your child will actually go in school?") for the study child were both significantly higher in the high than in the low reading groups, although these variables were not significantly associated with the extremes in math performance. Similarly, a rating scale indicating the amount of time mothers spent reading to their 4-year-old children significantly discriminated the high and low reading groups, although it was unrelated to the extremes in math performance. Thus, consistent with findings recently reported by Kagan and Zahn (1975), Reading scores were correlated higher with these indices of the child's early home environment than were Math scores, suggesting the former test taps sociocultural experiences more. The number of groups to which the mother belonged, included as a possible measure of alienation, however, failed to discriminate high and low groups; for this economically disadvantaged sample, most mothers did not belong to any groups.

As can be seen in Table 7, children in the high (and low) groups in both reading and math were already high (or low) on a number of cognitive-perceptual

Table 7

Measures of Cognitive, Perceptual, and Self-Regulatory Behavior for the Highest and Lowest Scoring Children

Child Measure	Statistic	Year 1 Sample[a]	High Reading	Low Reading	r	High Math	Low Math	r
Hess & Shipman	n	389	25	23		25	24	
8-Block Sorting	M	3.46	4.92	2.57	.57**	4.52	2.63	.51**
Task: Total Score	SD	1.78	2.06	1.24		1.87	1.28	
Johns Hopkins	n	370	24	20		24	22	
Perceptual Test:	M	16.07	17.71	14.55	.38**	17.29	13.86	.34**
Total Score	SD	4.77	3.29	4.62		4.98	4.64	
Matching Familiar	n	369	25	23		25	24	
Figures: Mean Errors	M	.70	.50	.71	-.37**	.59	.77	-.28*
per valid item	SD	.31	.25	.31		.24	.39	
Peabody Picture	n	352	21	22		20	23	
Vocabulary Test:	M	20.96	27.10	19.23	.34**	22.95	16.78	.35*
Total Score	SD	10.65	10.39	11.66		7.62	8.89	
Picture Completion	n	371	25	24		25	24	
(from WPPSI):	M	3.81	5.88	2.33	.43**	4.60	1.58	.45**
Total Score	SD	3.99	4.34	3.13		3.86	2.00	
Preschool Embedded	n	317	24	13		24	17	
Figures Test:	M	11.28	13.54	11.69	.16	12.79	11.06	.14
Total Score	SD	5.98	5.07	6.38		4.80	7.96	
Preschool Inventory:	n	392	25	25		25	25	
Total Score	M	22.72	30.84	16.72	.58**	27.20	20.32	.33*
	SD	10.23	10.87	9.40		11.21	8.80	
Seguin Form Board:	n	288	22	15		20	17	
Log fastest time for	M	1.70	1.63	1.79	-.46**	1.64	1.76	-.34*
correct placement	SD	.18	.16	.15		.18	.16	
Sigel Object Categor-	n	275	19	18		19	17	
ization: Total grouping	M	2.39	3.58	2.67	.13	3.63	2.24	.20
responses	SD	3.22	3.40	3.79		3.82	3.29	

[a]Year 1 sample refers to all black Head Start-eligible children tested in Year 1.

*$p < .05$, one-tailed
**$p < .01$, one-tailed

measures administered when they were 3 1/2 to 4 1/2 years of age, suggesting their differential readiness (and probable differential teacher responsivity) in the preschool program most of them later attended. Of these measures, only number of correctly identified items on the Preschool Embedded Figures Test and number of appropriate grouping responses on the Sigel Object Categorization Test failed to significantly discriminate the high and low groups; both tasks were particularly difficult for this sample during this age period. It also should be noted that the child's test performance on the Eight-Block Sorting task reflects in part the adequacy of the instruction s/he received from the mother during the interaction session.

As indicated in Table 8, latency measures (i.e., time to first response) generally did not discriminate high and low groups; however, on the Preschool Embedded Figures Test, children in the high groups in both reading and math took significantly longer to respond, suggesting their early development of a more reflective response style. The Motor Inhibition Test, which is a measure of ability to inhibit response rather than a response style, also significantly discriminated high and low groups.

Table 9 indicates that early affective and social measures also can significantly discriminate high and low achieving groups in the third grade. Children in the high reading group were rated as significantly more cooperative during the structured mother-child interaction task sessions. Children in the high math group had significantly higher scores on the Brown IDS Self-Concept Referent Test, although it is not clear whether this reflects high self-esteem or simply indicates a clearer understanding of the task demands by the more cognitively advanced group. According to this latter interpretation, the reduced number of valid scores for the low reading group may account for the

Table 8

Measures of Self-Regulatory Behaviors
for the Highest and Lowest Scoring Children

Child Score	Statistic	Year 1 Sample[a]	High Reading	Low Reading	r	High Math	Low Math	r
Matching Familiar Figures: Latency (log [X + 1])	n	369	25	23		25	24	
	M	.59	.60	.62	-.11	.59	.63	-.13
	SD	.12	.11	.15		.10	.18	
Preschool Embedded Figures: Latency (log 10)	n	317	24	13		24	17	
	M	.83	.89	.80	.29*	.88	.71	.43**
	SD	.18	.12	.17		.13	.23	
Sigel Object Categorization: Latency (log 10)	n	275	19	18		19	17	
	M	.82	.88	.90	-.05	.89	.87	.06
	SD	.20	.19	.16		.21	.17	
Motor Inhibition Test: Average Slow Time	n	396	24	24		24	24	
	M	47.18	50.20	45.81	.28*	49.70	44.96	.26*
	SD	7.82	7.70	7.43		10.87	6.13	

[a]Year 1 sample refers to all black Head Start-eligible children tested in Year 1.
*$p < .05$, one-tailed
**$p < .01$, one-tailed

Table 9

Affective and Social Measures
for the Highest and Lowest Scoring Children

Child Score	Statistic	Year 1 Sample[a]	High Reading	Low Reading	r	High Math	Low Math	r
Mean Cooperation Rating from Mother-Child Interaction Tasks	n	389	23	20		25	24	
	M	3.63[b]	2.52	4.45	-.48**	3.00	3.88	-.23
	SD	2.03	1.62	1.99		1.66	2.03	
Brown IDS Self-Concept Referents Adjusted Score	n	344	25	16		24	20	
	M	.80	.85	.80	.16	.88	.75	.46**
	SD	.15	.13	.17		.11	.16	
Vigor 2 : Mean # turns	n	383	25	25		24	25	
	M	11.08	12.16	10.60	.25*	11.54	11.00	.07
	SD	3.30	2.54	3.55		3.22	4.76	

[a]Year 1 sample refers to all black Head Start-eligible children tested in Year 1.
[b]Low scores indicate high cooperation.
*$p < .05$, one-tailed
**$p < .01$, one-tailed

lack of correlation for this comparison. Performance on the Vigor Task has been interpreted as reflecting assertiveness and cooperation rather than vigor (Shipman, 1972b); children in the high reading group obtained significantly higher scores on this task.

These data are consistent with the extensive research literature on the important relationship of early home influences to the young child's school performance (e.g., Bronfenbrenner, 1974; Hanson, 1975; Hess, Shipman, Brophy, & Bear, 1969; White, Day, Freeman, Hantman, & Messenger, 1973). Although status/situational and process variables may share considerable commonality in their prediction of the child's subsequent reading and math performance, the process variables help provide important explanatory information and programmatic clues that are not obvious from status characteristics alone. As was pointed out in a recent extensive discussion of relationships among family status, situational, and process variables and children's academic achievement (Shipman et al., 1976), status characteristics may be viewed as providing differential opportunities for various processes to emerge. Thus, a higher level of parental education is associated with greater academic knowledge, increased awareness of public affairs and popular culture, more informed perceptions of school, and continued seeking of new knowledge as in reading books and magazines (cf. Hyman, Wright, & Reed, 1975), all of which may have impact on the child's knowledge and motivation for learning. In addition, by providing differential opportunities for the parent's participation in society, there may be indirect effects upon the child via parental attitudes and child-rearing behaviors acquired through such experiences. Another example of the interrelatedness of status, situational, and process variables is the commonly found association between low economic status, high

household density, and parental use of physical punishment with their children. These negative effects of crowding have been shown to be exacerbated by additional stresses in the home (Booth & Edwards, 1976). Family process variables are thus considered as the underlying mechanisms by which child outcome differences associated with family status characteristics are created and maintained.

The findings also suggest that a number of preschool measures of the child's cognitive, affective, and social functioning may indicate early strengths and weaknesses relevant to the child's later school functioning, perhaps in part due to their reflecting children's differential responsivity to early intervention. Further analyses of data collected at ages five and six are likely to suggest other important areas of inquiry with some measures not found to be differentially predictive at age four becoming so at a later developmental stage. For example, preliminary analyses suggest this is the case for the reflectivity-impulsivity dimension assessed with the Matching Familiar Figures Test and for academic achievement motivation which newly emerges during the child's attendance in a preschool program.

But a major conclusion from these data is that these family and child variables are not necessarily associated with exceptionally high or low academic achievement; for any one of these variables or a composite of home or child variables much of the variance in individual scores remains unaccounted for. Also, the correlations do not provide rationales for the degree of association obtained. Thus, to obtain clues to the nature of moderating variables it was decided to study intensively those children who showed the greatest absolute deviation in cognitive-perceptual performance, whether in a positive or negative direction, thereby taking into account potential interactions among family, child, and school variables and also differential sequences of school experiences.

Case Studies of Children Showing Exceptional Change

The emerging causal hypotheses derived from this intensive case study approach may be grouped into three major categories of locus of change: the child, the home, and the school. Within each of these broad classifications, a number of subcategories can be derived. For example, change in the child's cognitive-perceptual performance can be viewed as a function of change in the child's physical well-being (e.g., a serious illness or accident leading to sensory impairment and/or absence from school, remediation of an interfering defect, gradual "catch up" with developmental lag arising from premature birth); emotional status (e.g., becoming more or less shy and inhibited in responding to an unfamiliar adult in a testing situation, being more or less willing to attempt a response when the questions become more difficult); motivation (e.g., changes in the child's valuing of school performance, in his or her expectancies for success in performing school tasks, and in his or her enjoyment in the school situation); and in general cognitive strategies (e.g., changes in ability to attend, reflect upon, differentiate). As the case studies clearly exemplified, however, rather than acting in any simplistic compartmentalization these changes in the child's functioning should be viewed as dynamic interdependencies among physical, affective, social, and cognitive behaviors. For example, for some children, preschool attendance appeared to affect most their self-confidence and ease in relating to others; these changes in personal and social variables later enabled them to better attend and assimilate academic instruction. For others, acquisition of new preacademic skills in preschool appeared to be causally related to their increased social and affective competencies.

Nevertheless, except for one child for whom a serious accident did seem

to account for the striking decrement in performance, the above postulated changes which were evidenced in the case histories examined could not be viewed as sufficient causes. Examination of other case histories reflected similar events but without the same consequences.

In examining responses to the three parent interviews obtained when the child was four, five, and nine years of age, examples were provided for changes in family status, situational, and process variables. Changes in status and situational variables included those in family structure, employment status, welfare status, material well-being, home ownership, crowding, mobility, etc. Attitudinal and behavioral changes were noted also, reflecting changes in feelings of alienation, powerlessness, and optimism, in child-rearing practices, and in participation in school-related activities. Again, there was no one area of change that was unique for families of "exceptional" study children.

Similarly, examination of programmatic information gathered regarding the schools and classrooms children attended yielded no striking contrast at any one grade level. But, when examining the data sequentially, a pattern did emerge for children in the exceptional positive deviation category; a cognitively stimulating atmosphere where the teacher was rated at least moderately warm had been present for at least several years. For example, what may have started as small increases in the child's knowledge of school-relevant information, confidence, task orientation, and achievement motivation in a Head Start preschool program was apparently reinforced and enhanced by teachers in kindergarten and later primary grades. Most of these children (in contrast to many others in the study sample) never had teachers who were described as unenthusiastic, unprepared, using primarily negative reinforcement techniques, or providing little cognitive stimulation.

The most common picture that emerged for those children who showed the most gain in academic achievement was the previously mentioned continuing warm and stimulating classroom environment combined with a home environment that provided the child emotional support in general and support for school activities in particular. Examples of parental school-supportive activities included visiting the school, participating in classroom activities, knowledge of the child's functioning in school, higher expectations for the child's educational attainment, and, in some cases, the parents' involvement in their own continuing education.

It must be emphasized that for these "deviation" cases the above examples of supportive activities emerged following the initial parent interview. In some cases they reflected changes in parental behavior as a function of the preschool program the child attended. For example, in one family, the mother began by visiting her child's preschool program, later became a volunteer classroom aide, and by the time the child was in third grade had returned to school for a GED high-school equivalency certificate and was enrolled in a local community college. Both parent and child showed parallel educational growth. But it appeared obvious that the home did not impact on the child's progress in a sole or independent fashion. The child's preschool and grade school experiences were directly facilitating not only to him but to his mother, and thereby also acted indirectly on the child. The mother obtained information and emotional support in the school setting. In response to greater acceptance she participated more; and from such participation there appeared to develop an increased sense of efficacy and optimism with greater awareness and use of community resources to meet family needs.

Another example of parallel child and family growth is seen in the

following case. During the first two years, Mary (fictitious name) was generally moody, restless, and uncooperative in the testing sessions, both with her mother and the testers. She appeared quite timid and shy with strangers. Her mother, estranged from her husband, and living on welfare, also appeared somewhat aloof and negative. She reported having no friends or relatives and as rarely going out. Mary attended a summer Head Start program prior to kindergarten, subsequent to which she appeared less shy and socially immature. She also performed better on the Year 3 measures. Classroom observations indicated that she attended a highly motivating, stimulating first grade. Her teacher provided considerable feedback and intellectual stimulation, often using unplanned incidents that occurred. Students appeared happy and involved and the teacher individualized the curriculum to a great extent. Mary prospered in this environment and her teacher described her as a mature, responsible, and excellent student. Mary's attitudes toward herself and school improved considerably and she did well on the various measures we administered that year. She continued to have a warm, individualized, and stimulating classroom in second and third grades. Mary's school records got progressively better, both academically and emotionally; she was described as having matured socially, as being a responsible, well-liked classmate, and as exhibiting a very high level of persistence in her schoolwork. Meanwhile, her mother appeared considerably less alienated, held high aspirations for her child's educational attainment, and had enrolled in a community college. Mary, a shy, uncooperative 4-year-old, was at age 9, a confident, happy child enjoying school and performing well.

Another child, the youngest of 15 children, was very nervous and shy during initial testing. Not used to being required to do things on his own, he refused several tasks and cried often. The next year he attended Head Start.

According to his mother, Head Start "changed him in every way," but especially in helping him learn to play with other children and become more independent. When seen again at the testing center he was no longer reserved and shy. In addition to these increased social skills his test performance showed he had gained much from the cognitive stimulation of the preschool program and also from his daily viewing of Sesame Street. Moreover, his parents continued to provide a very warm, affectionate home environment. Both parents were highly supportive of school activities; they read to their son often and had high educational aspirations for him. Despite the many children in the family, the mother's interview responses reflected a very differentiated and realistic appraisal of her child's strengths and weaknesses. In kindergarten he was described as having made very good classroom social and emotional adjustment and was a happy, independent, and able learner. His first grade classroom appeared generally unstimulating, but the children were attentive and studious and the teacher tried to individualize the curriculum in a generally open, permissive environment. In contrast to Head Start he reported liking school "only a little bit." His performance in school and on our test batteries, however, remained above average. Fortunately, his classroom experiences were much more positive thereafter. His third-grade class, organized for team teaching, was a particularly happy, orderly, and stimulating environment. The teachers were affectionate and spent much of their teaching time with individual children. Again, home and school together provided a nurturing and supportive environment for the child's growth.

Just as the above cases exemplify the realization of the child's potential for growth when home and school work together to provide an emotionally supportive and cognitively stimulating environment, the next example indicates

the tragedy that evolves when home and school not only fail to interact, but when there is a lack of communication and coordination among those adults representing various social agencies purported to serve the child. When first seen at the testing center, John (fictitious name) was outgoing, friendly, and verbal, responding well to the variety of tasks in the four-day battery. He lived with his mother and two older sisters in a small crowded apartment with few conveniences or possessions of his own. During the mother-child interaction sessions, he showed considerable initiative in responding, and was highly task-oriented and attentive. His mother was affectionate and provided him with frequent positive feedback and praise. Although she was somewhat limited in her presenting of task-relevant information, the child learned the task quickly and well. When seen the following year at age four-and-a-half, John continued to perform well on the many diverse tasks administered, and testers consistently described him as an attentive, friendly, verbal boy with whom they enjoyed working. He attended a Head Start program and was described by his teacher as socially mature, creative, and quick to learn. His kindergarten teacher gave a similar appraisal, although she noted he seemed somewhat bored. His individual testing that year continued to indicate above-average cognitive and social competencies. When interviewed in first grade, he expressed strong liking for school, especially reading. The teacher rated him as very task-oriented, friendly, and non-aggressive. However, he changed from public to private school in first grade and when he transferred back to public school in second grade he began to show increasing absenteeism. His test performance, however, continued to be adequate. That year his teacher rated him as only somewhat attentive in school. In third grade he continued to perform well on individual tests, but when interviewed again about school he

expressed considerable dislike, especially for reading. His teacher described him as not at all attentive in his school work and not friendly with his classmates. On the group achievement tests he scored significantly below the mean performance level for other black Head Start-eligible study children. During the home interview the mother repeatedly expressed concern about her son. She reported that within the past two years he complained increasingly of stomach-aches necessitating increasing absence from school. He finally had to be hospitalized and was tentatively diagnosed as having a stomach ulcer. The mother felt her son's problems were due to emotional upset over not having a father. Although badly wanting to help her son, she didn't know what to do. There was no indication of communication between home and school, no sharing of information, no provision of resources. Teachers at different grade levels apparently were not questioning the discrepancies in teacher ratings and attempting to understand and counteract their cause. Nor was the physician who treated this child consulting with his teachers or obtaining counseling help for him or his mother. Yet without such communication, such combining of knowledge and resources, how likely is this child, particularly one who is economically disadvantaged and of minority status, to reverse his downward achievement trend? Instead, a horrendous cycle of absenteeism, little if any academic progress, negative reinforcement, reduced academic motivation and interest, and increasing anxiety and negative self-evaluation has been set in motion.

In other cases, early gains gradually or abruptly disappeared in the absence of home and/or school support. One 4-year-old study child lived with her parents and four siblings in a bare two-room apartment with no toys, books, or TV. A grandmother babysat when the mother went to work. At age 5 this

child attended Head Start. The teacher was affectionate, enthusiastic, and stimulating and worked with the children in various-size groupings to match individual needs and preferences. Angela (fictitious name) was happy with newly discovered toys and materials and improved in her test performance. There was continuity of enthusiasm, affection, and stimulation in Angela's first-grade classroom, and she received special reading instruction to continue the progress she made in preschool. At the end of the year, it was recommended that she not continue with the special instruction. Her teacher noted that Angela was "definitely capable of reading but needed constant encouragement." Unfortunately, she did not receive the attention and encouragement she needed. Subsequent classroom observations in third grade revealed that the teacher offerred no stimulation of thinking and displayed no affection or enthusiasm; efforts at individualization were rare. The home interview revealed no parental encouragement or stimulation of intellectual activities and little knowledge of their daughter or her progress.

Another girl when first seen was living in a four-room rundown home with her parents and nine brothers and sisters. The father was disabled and unable to work; the mother worked part-time as a maid. There was little intellectual stimulation and whipping was frequently used for discipline. The child worked diligently and well during the testing sessions and enjoyed the various tasks. In Head Start she progressed well in the flexible, cognitively stimulating environment. Her home situation, however, had not improved and one tester described her as a cooperative but somewhat emotionless robot. Her first-grade class appeared unstimulating and lacking in warmth. Although the child described herself as liking school and feeling happy, on the Human Figures Drawing Test, one of the two small figures was crying. The atmosphere of

her third-grade classroom appeared worse. Teacher enthusiasm and warmth were rated extremely low and concern with obedience very high. The child continued to report liking school and feeling good about herself. Nevertheless, her test performance continued to decline. At home, her parents were not working; income was derived from welfare and the intermittent salaries of the older children. If anything, the family was more impoverished; with no electricity in the home the mother held a lantern to help the interviewer read the questions. This case and the many others clearly indicate the need for working with the total ecology of the child if we truly care and wish to serve our nation's children well.

It should be noted that in reviewing the case records of the few children who were classified in both high and low extreme categories, that is, those who were high in one subject area and low in another, few salient clues emerged to explain such differences. An exception was the boy who had a long history of visual problems during this period. Following initiation of medical treatment the child still showed little interest in reading activities. With continued treatment and sensory improvement, and a cumulative history of success experiences in reading situations, this discrepancy would be expected to disappear.

To obtain possible additional clues to causal patterns a supplementary perusal of the case records for those black Head Start-eligible children who had been retained at an earlier grade level or who had skipped a grade was done. After eliminating those cases with borderline school entry birthdates, the same intensive examination took place for children who showed a large discrepancy with their initial Preschool Inventory performance. There was a trend for the child's sex and preschool enrollment to be related to retention

(with boys and children with no known preschool attendance retained more often) suggesting again that early intervention may be of particular help in assisting low-income boys in making the transition to grade school demands. No other unique patterns among child, family, or school information were evidenced.

Before concluding this description of study findings it must be pointed out that there were cases where examination of the many accumulated bits of information provided no apparent clues as to causal factors for exceptional academic gain or loss. Some children appeared to have everything working against them, an exceedingly impoverished, continuing stressful, non-supportive home environment, and a sequence of unexceptional classroom settings, but they still evidenced strong academic skills in third grade. Of course, the consequences of these negative factors may appear later. One such child has begun to express increasingly negative statements about himself and his family, negative feelings which if continued may increasingly interfere with other areas of functioning. However, it is also clear that despite the extensive and in-depth assessment provided in the present study, we have only begun to tap the surface of the crucial dynamic factors in the child and his or her environment which affect performance in the school setting.

Chapter 5

SUMMARY AND CONCLUSIONS

The present report provides a description of a series of exploratory analyses and intensive case studies which focused on those black Head Start-eligible study children in Lee County, Portland and Trenton who in third grade performed exceptionally well or poorly on the Cooperative Primary Tests in reading and math in comparison to other study children of similar ethnic and economic background. Particular attention was paid to an in-depth examination of the massive array of child, family, and school information gathered for those children who had deviated most, in a positive or negative direction, from the level of achievement performance which would have been expected given their level of preacademic skills (i.e., Preschool Inventory performance) at age four.

As might be expected, the case studies revealed the multiple determinants of academic success or failure; on first reading, each child's record appeared to have a unique history of causal antecedents. Among the many child, family, and school variables examined, no one score or composite of scores was consistently associated with level of academic achievement. When examining the extent to which children were categorized as exceptional according to geographical region, family structure, sex, and preschool attendance, only consistent differences according to site were evidenced with more children from Lee County doing poorly and more children from Portland doing relatively well in reading and math. However, the extent to which site differences reflect differences in initial sample characteristics, or in geographical region, urbanness, preschool teacher certification, preschool program sponsor, and age of preschool entry (all of which are confounded with site in this sample) or other unmeasured

relevant variables is unknown. Since most of these Head Start-eligible children had actually attended Head Start, preschool experience per se did not differentiate high- and low-scoring children; however, in checking those children who had been retained in first or second grade, a more severe index of poor school progress, a higher percentage of children who had not attended preschool was found. Moreover, for those Head Start children who later attended a Follow Through program the data suggested the positive impact of continued broad comprehensive services to the children and their families. When examining teacher background characteristics, (i.e., age, years of schooling, and amount of teaching experience), it was found that at any one grade level most teachers had children in both the high and low categories; gross school variables such as school size, class size, and percentage of minority students also revealed no consistent differences although there was a trend for schools with more support staff to have more children in the high-achievement groups. Such findings point to the importance of investigating specific teacher-child interactions for understanding school effects.

Nevertheless, some significant generalizations emerged from the intensive longitudinal examination of these exceptional study children. 1) Any particular aspect of individual functioning must be evaluated in the context of other aspects of the developing organism and the environmental conditions in which the organism is behaving. For example, development of affective and intellective behaviors were found to be closely intertwined and knowledge of behaviors in one domain aided interpretation in the other whether for understanding responses to the tester or to teachers and peers in the classroom. Similarly, intellectual and motivational correlates of variation in the child's health and physical status were evidenced. 2) Furthermore, the implications of many

variables become understandable only after examining that variable and its interactions developmentally. This suggests a theoretical approach which considers developmental changes in both the child and the environments in which that development is embedded, and more extensive use of longitudinal designs. It also implies that providing "exceptional" children such as those in the present sample with appropriate learning environments requires a historical perspective which a cut-off score does not suggest. 3) Point-biserial correlations obtained between a selected group of family status, situational, and process variables and the child's designation in high or low reading and math groups indicated that even within this restricted SES sample of economically disadvantaged families, differences in parental educational level, physical resources in the home, and encouragement of school-relevant skills and attitudes were associated with the child's later school progress. Similar findings were obtained by Greenberg and Davidson (1972) and Stedman and McKenzie (1971) in their research with high- and low-achieving low-SES urban northern black and southwestern Mexican-American children, respectively. Low-income families are not a homogeneous group. The lack of association obtained between parental occupational status and children's academic achievement again highlighted previous reported study findings (Shipman et al., 1976) on the apparent different meaning of this variable for black and white families. 4) Not only do home and school variables, particularly parent-child and teacher-child interactions, influence the child's behavior, but most such effects are reciprocal and not unidirectional (e.g., the case history of "John"). 5) Interactions of individuals and the environments in which they function are dynamic; predictability of a child's achievement from early indices of the home environment should not be interpreted to mean that these predictors necessarily

determine the child's achievement. Families, children, and schools can and do change, with corresponding changes in the nature of their interactions, and such change can be facilitative or harmful. In contrast to some interpretations of early childhood research findings, for example White and Watts (1973), the age period 3-6 is not just a period of refining established relations. 6) A variety of measures of the child's functioning at age four were found to be useful in identifying children likely to do well or poorly during the course of their acquisition of basic school skills of reading and math. Such measures were not limited to those in the cognitive-perceptual area, but included tasks assessing affective behaviors and cognitive styles. The positive use of such measures as initial screening instruments to provide guidance for tailoring programs to meet children's needs should be emphasized as contrasted with their use in making placement decisions which may act as self-fulfilling prophecies. Preschool assessment can facilitate the provision of programs geared to the individual needs of children rather than those planned on the basis of ascribed needs of children according to various status characteristics. 7) In many cases, developmental progress was gradual across the time intervals in which measures were administered. In addition, growth in one domain often served as a precursor to growth in another; thus, development in one area may proceed in seemingly irregular spurts and be inappropriately assessed by traditional linear analytic methods. We need to develop greater sensitivity to measurement and interpretation of such changes and their cumulative effects so that we can enhance positive growth and counteract possible negative influences. These considerations also suggest the importance of long-term evaluation of intervention efforts. It may take several years of small cumulative gains before such gains are large enough to be statistically significant which may account

in part for some of the "sleeper" effects recently reported for upper-elementary grade low-SES children who had experienced early intervention programs (Palmer, 1976; Seitz, Apfel, & Efron, 1976). 8) As a corollary, facilitating influences usually require continuing reinforcement to maintain their positive effects. For example, most youngsters in Head Start evidenced increases in preacademic skills, task orientation, achievement motivation, and social skills in relating to their peers and to other adults. The academic gains generally were not maintained, however, when the grade-school program apparently did not capitalize on children's acquired skills and motivation. The finding by Coleman and his colleagues (1966) that disadvantaged children are more affected by the quality of teaching may be more crucial as children's sensitivity to their school experience is heightened by programs such as Head Start. For those children who showed the greatest gain in academic skills between age four and nine, following Head Start attendance there was a continuity of facilitating school experiences; at each primary-grade level these children had enthusiastic, warm, positively motivating, cognitively stimulating teachers who taught in a one-to-one or small-group setting. Such continuity in facilitating school experiences is particularly non-existent for a sizable minority of low-income children who move frequently between schools, a situation common to many urban areas. Moreover, this continuing warm and stimulating school environment was combined with a home environment that provided the child emotional support in general and support for school activities in particular. 9) Finally, in reviewing the information gathered one becomes acutely aware of the multiplicity of positive and negative factors for those children in these extreme achievement categories. Thus, it is not a particular parent, teacher, or child attitude, attribute, or behavior, or a particular social setting, but

the cumulative effects of their multiple interactions. Moreover, for different children, different clusters of variables appear to be differentially effective, suggesting the need for multidimensional assessment of individuals and their environments.

The present case study approach has generated a number of hypotheses that should be investigated further in the larger study sample. In future analyses, particular attention will be paid to investigating the complementarity of home and school influences, differential effects for congruent and non-congruent instructional sequences in relation to child characteristics, and the nature of the complex interactions among affective, social, cognitive, and perceptual development. Subsequent analyses might examine whether home and school influences operate in an additive or interactive fashion in their impact upon the child's educational progress. Also, there is need for more precise delineation of the meaning of continuity of experiences. To continue to meet the child's developmental needs continuity may necessitate change not continuation of experience. Again, a "building block" notion of dynamic transactions (cf. Sameroff, 1975) appears to provide a more adequate conceptualization of what occurs in these environmental interactions. Also, further efforts to delineate the most predictive composite at each age within SES, sex, and race subgroups for those measures administered during the first four study years should provide guidance to current efforts at early screening and identification of children with potential learning disabilities. There is also considerable need for more research aimed at understanding those children who show outstanding resilience amidst considerable environmental stress. When examining these case histories one cannot help but be impressed by the strengths one perceives in the children and in their families. Most studies

in the literature, however, have focused on pathology; our understanding of such strengths is meagre at best.

As case histories in this study indicate, low socioeconomic status and minority group membership do not necessarily imply low school achievement. The children showed a wide range of aptitudes and abilities. Moreover, parents and teachers do make a difference. Thus, findings of this study are supportive of the importance of early parent-child interactions as well as the child's early acquisition of school-relevant skills and motivation and those programs such as Head Start which emphasize the parents' involvement in the child's educational experience. In describing the interrelatedness of family status, situational, and process variables, the data also suggest the potential positive impact of economic aid to impoverished families in raising competence levels in the children (i.e., even small differences in material possessions and household density were associated with children's higher achievement) and the necessity for coordination of services to support the child and his/her family. These findings and the several case histories described are consistent with those projects recently reviewed by Meier (1976) in suggesting that cognitive gains are likely to be largest and to be sustained when there is support in the total ecology of the child, not just in the quality of parent-child interactions alone, but also in adequate health care, nutrition, housing, and general family support. They also support his proposal for Neighborhood Family Development Centers to coordinate comprehensive service, training and research functions as a basis for modifying the total ecology of the developing child.

The data also indicated the potency of classroom interactions on the child's progress. Similarly, in his recent book Bloom (1976) challenges the

schools to provide all children with appropriate learning opportunities and describes a mastery approach that had promising results with older students. The importance of the complementarity among socializing influences, however, was evident in the present sample. Parent-to-child or teacher-to-child models appear too simplistic for characterization of minority children's achievement behaviors. Sustained intellectual growth depends on the quality of relationships established between parent, teacher, and child. More research and development activities are needed which focus on elaborating the mechanisms by which home and school can work more effectively together to enhance the child's development.

The children in the present sample would be considered by most as "children at risk," but in following six years in their lives we see no inevitable sequence of events which could not have been otherwise determined. Those case studies which exemplified the nurturance and acceleration of competencies during the six-year span of the study speak out against those who accept the inevitability of increasing despair and failure for low-income minority children in school. Our responsibility is to create situations where such children are typical, not exceptional. These children had a family able to provide love, concern, and support for their school activities, teachers who provided them with the necessary encouragement, stimulation and reinforcement for learning in a manner responsive to their particular learning styles, and they were not beset by physical or other problems interfering with their ability to respond adequately and progress. We must coordinate our nation's resources to assure no child receives less. It is hoped that this study provides some clues to the theoretical considerations and applied strategies that will contribute to that undertaking.

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APPENDIX A

MEASURES USED IN 1969-74

INSTRUMENTS USED IN ETS - HEAD START LONGITUDINAL STUDY OF YOUNG CHILDREN AND THEIR FIRST SCHOOL EXPERIENCES FOR 1969-1974

	YEAR					
	1	2	3	4	5	6
	1969** Age 3 1/2	1969-70 Age 4 1/2	1970-71 Age 5 1/2	1971-72 Age 6 1/2	1972-73 Age 7 1/2	1973-74 Age 8 1/2
A. FAMILY MEASURES						
Interview	***LPST	PST	L			LP T
B. MOTHER MEASURES						
*Affectionateness Ratings (used with all Mother-Child Interaction measures)	LPST	PST	L			
*First Day of School Question	LPST	PST	L			
C. MOTHER-CHILD INTERACTION MEASURES						
Hess & Shipman Toy Sorting Task	LPST					
Hess & Shipman Eight-Block Sorting Task	LPST	PST	L			
Hess & Shipman Etch-A-Sketch Task	LPST		L			
D. CHILD MEASURES						
Reasoning and Analytic Styles						
Block Design (WPPSI & WISC)			LP			LP T
Embedded Figures Test - Preschool & Children's Forms	LPST	PST	LP T	LP T		LP T
Picture Completion (WPPSI & WISC)	LPST		L	LP		LP T
Hess & Shipman Toy Sorting Task	LPST					
Hess & Shipman Eight-Block Sorting Task	LPST	PST	L			
Human Figure Drawings			LP T	LP T		LP T
Ravens Colored Progressive Matrices				LP T		
Sigel Categorizing Test - Pictures and/or Objects	LPST	PST	LP T	LP T		LP T
Attention, Learning, Memory						
Digit Span (WISC)	LPST	PST				LP T
Fixation Time	LPST	PST				
Relevant Redundant Cue Concept Task		PST				
Stanford Memory Test				LP T		LP T
Probability Learning Test	LPST					
Attitudes, Interests						
Brown IDS Self-Concept Referents Test	LPST	PST	LP T	LP T		
Teacher Referent	LPST	PST	LP T	LP T		
Self-Concept Referents Test Mother Referent						LP T LP T
Social Schemata		PST	LPST	LP		

*Measure demands no time of subject.

**Measures administered during spring and summer 1969.

***LPST = Lee County, Alabama; Portland, Oregon; St. Louis, Missouri; Trenton, New Jersey.

INSTRUMENTS USED IN ETS - HEAD START LONGITUDINAL STUDY OF YOUNG CHILDREN AND THEIR FIRST SCHOOL EXPERIENCES FOR 1969-1974	YEAR 1	2	3	4	5	6
	1969** Age 3 1/2	1969-70 Age 4 1/2	1970-71 Age 5 1/2	1971-72 Age 6 1/2	1972-73 Age 7 1/2	1973-74 Age 8 1/2
Controling Mechanisms						
Locus of Control			L	LP T		LP T
Matching Familiar Figures Test	***LPST	LPST	LP T	LP T		LP T
Mischel Technique	LPST	PST				
*Modified Hertzig Procedure	LPST	LPST	LP T	LP T		LP T
Motor Inhibition Test	LPST	LPST	LP T	LP T		LP T
Risk-Taking	LPST	PST	L			
Creativity						
Children's Drawings			LP T	LP T		
Naming Category Instances Task		PST		LP T		LP T
Sticker Task				LP		LP T
What Can You Use It For?						LP T
What Could It Be?						LP T
General Knowledge						
Cooperative Preschool Inventory (Caldwell)	LPST	LPST	L			
TAMA General Knowledge	LPST	PST				
General Personality						
Coopersmith Self-Esteem Inventory						LP T
*Personality Observations		PST				
*Personal/Social Ratings			LP T			
*Test Situation Ratings			LP T	LP T		LP T
*Child Cooperation (Used with all interaction measures)	LPST	PST	L			
Perception						
Auditory Discrimination Test (Wepman)			L			
Children's Auditory Discrimination Inventory	LPST	PST				
Bender-Gestalt						LP T
Form Reproduction -						
Partial Battery Caldwell (PSI)	LPST	PST	L			
Geometric Forms (WPPSI)		PST	L			
Johns Hopkins Perceptual Test	LPST	LPST				
Seguin Form Board	LPST	PST				
Auditory-Visual Integration Test				LP		LP T
Spatial Relations (PMA)						LP T

*Measure demands no time of subject.
**Measures administered during spring and summer 1969.
***LPST = Lee County, Alabama; Portland, Oregon; St. Louis, Missouri; Trenton, New Jersey.

INSTRUMENTS USED IN ETS - H D START LONGITUDINAL STUDY OF YOUNG CHILDREN AND THEIR FIRST SCHOOL EXPERIENCES FOR 1969-1974	YEAR					
	1	2	3	4	5	6
	1969** Age 3 1/2	1969-70 Age 4 1/2	1970-71 Age 5 1/2	1971-72 Age 6 1/2	1972-73 Age 7 1/2	1973-74 Age 8 1/2
Piagetian						
Boy-Girl Identity Task	***LPST	PST	LP T	LP T		
ETS Enumeration	LPST	LPST	LP T			
Spontaneous Numerical Correspondence	LPST	PST	L	LP		
Conservation of Number			L	LP		
ETS Spatial Egocentrism Task		PST	L	LP		LP T
Quantitative						
Cooperative Primary Tests: Mathematics				LP T	LP T	LP T
Social/Academic Motives						
Gumpgookies (Indiv. & Group forms)		PST	LP T	LP T		
Hess & Shipman Etch-A-Sketch Interaction	LPST		LP T			
Open Field Test	LPST	PST				
School Perception Interview/Sociometric Technique				LP T		LP T
*California Preschool Competency Scale			LP T			
*Schaefer Classroom Behavior Inventory				LP T	LP T	LP T
Verbal						
Cooperative Primary Tests: Pilot				LP T	LP T	LP T
Listening				LP T	LP T	LP T
Reading				LP T	LP T	LP T
Word Analysis				LP T	LP T	LP T
ETS Story Sequence Tasks	LPST	PST	LP T			LP T
ETS Matched Pictures Language Comprehension Task	LPST	LPST	LP T			
Massad Mimicry Test	LPST	PST	LP T	LP		
Metropolitan Readiness Tests			LPST			
ETS Adaptation of Peabody Picture Vocabulary Test	LPST	LPST				
ETS Test of Linguistic Structures				LP		
*Medical Record	LPST	PST	L	LP T		LP T
Vigor Measure	LPST	PST	L			

*Measure demands no time of subject.
**Measures administered during spring and summer 1969.
***LPST = Lee County, Alabama; Portland, Oregon; St. Louis, Missouri; Trenton, New Jersey.

INSTRUMENTS USED IN ETS - HEAD START LONGITUDINAL STUDY OF YOUNG CHILDREN AND THEIR FIRST SCHOOL EXPERIENCES FOR 1969-1974	YEAR					
	1	2	3	4	5	6
	1969** Age 3 1/2	1969-70 Age 4 1/2	1970-71 Age 5 1/2	1971-72 Age 6 1/2	1972-73 Age 7 1/2	1973-74 Age 8 1/2
E. CHILD-CLASSROOM MEASURES						
*PROSE		***PST				
*Individual Pupil Observation/Schaefer CBI (adapted for classroom observers)						L
F. TEACHER-CLASSROOM MEASURES						
*Enhancement of Learning Inventory		PST	LPST	LP T	LP T	LP T
*Teacher Questionnaire		LPST	LPST	LP T	LP T	LP T
*Teacher Ability Measure		LPST	LPST	LP T	LP T	LP T
*Teacher Aide Questionnaire		PST	L			
*Global Classroom Ratings		PST	LPST	LP T	LP T	LP T
*Aggregated Characteristics of Pupils (Test scores, school records, etc.)		PST	LPST	LP T	LP T	LP T
*Classroom Facilities Inventory and Assessment of Classroom Programs				LP T	LP T	LP T
G. SCHOOL/HS CENTER MEASURES						
*Head Start Inventory		PST	L			
*School Inventory		LPST	LP T	LP T	LP T	LP T
H. COMMUNITY MEASURES						
*Inventories		LPST	LP T	LP T	LP T	LP T
I. TESTER/OBSERVER MEASURES						
*Ability Measure	LPST	LPST	LPST	LP T	LP T	LP T
*Tester/Observer Questionnaire	LPST	LPST	LP T	LP T	LP T	LP T

*Measure demands no time of subject.
**Measures administered during spring and summer 1969.
***LPST = Lee County, Alabama; Portland, Oregon; St. Louis, Missouri; Trenton, New Jersey.

APPENDIX B

CHILD TEST BATTERIES

Years 1, 2, 3, 4 and 6

Year 1 - Testing Sequence

Lee County, Portland, and Trenton

Day 1

Mother-Child Interaction tasks:

- Toy Sorting
- Eight-Block Sorting
- Etch-A-Sketch

Motor Inhibition Test
ETS Matched Pictures I

Battery A	Estimated Time (in minutes)
Preschool Inventory (Caldwell)	20
Vigor I (Running)	5
Spontaneous Numerical Correspondence	5
Massad Mimicry Test	10
Rest-Play	10
TAMA General Knowledge Test I	10
Risk-Taking	20
Picture Completion (WPPSI)	5

Battery B	
Sigel Object Categorizing Test	25
Mischel Technique	5
John Hopkins Perceptual Test	15
Open Field Test	10
ETS Story Sequence Test I	20
Seguin Form Board	5
Matching Familiar Figures Test	15

Battery C	
Fixation	20
Vigor 2 (Crank-turning)	5
Brown IDS Self-Concept Referents Test	10
Preschool Embedded Figures Test	15
Rest-Play	10
Children's Auditory Discrimination Inventory	15
Peabody Picture Vocabulary Test	15
Boy-Girl Identity Task	5
Enumeration I	5

Year 2 - Testing Sequence

Portland and Trenton

Battery A	Estimated Time (in minutes)
First Day of School Question (mother)	5
Eight-Block Sorting Task (Hess & Shipman)	30
Vigor I (Hopping)	5
Stanford Memory Test	10
Boy-Girl Identity Task	10
Children's Auditory Discrimination Inventory	10
Rest-Play	(5)
Preschool Embedded Figures Test	15
Motor Inhibition Test	10
ETS Story Sequence Tasks, Parts 1 & 2	20
Massad Mimicry II	10
Risk-Taking 2	5
Battery B	
Sigel Object Categorizing Test	20
Vigor 2 (Crank-Turning)	5
Fixation Time	20
Naming Category Instances	15
Rest-Play	(5)
Peabody Picture Vocabulary Test, ETS Adaptation, Forms A & B	20
Spontaneous Numerical Correspondence	5
Gumpgookies	25
Seguin Form Board	5
Brown IDS Self-Concept Referents Test (Self and Teacher)	15
Battery C	
TAMA General Knowledge Test II	10
Preschool Inventory (Caldwell)	20
Form Reproduction	5
Mischel Technique	2
Johns Hopkins Perceptual Test	15
ETS Matched Pictures II	10
Open Field Test	(10)
Relevant Redundant Cue Concept Acquisition Task	15
Social Schemata	15
Matching Familiar Figures Test	15
Enumeration II	5
Spatial Egocentrism Task	15

Lee County

Test Battery	Estimated Time (in minutes)
ETS Matched Pictures II	10
Preschool Inventory (Caldwell)	20
Motor Inhibition Test (Drawing Subtest)	10
Johns Hopkins Perceptual Test	15
Brown IDS Self-Concept Referents Test (Self and Teacher)	15
Peabody Picture Vocabulary Test, ETS Adaptation, Form A	10
Matching Familiar Figures Test	15
Enumeration II	5

Year 3 - Testing Sequence

Lee County

Battery A	Estimated Time (in minutes)
First Day of School Question (mother)	5
Eight-Block Sorting Task (Hess and Shipman)	30
Etch-a-Sketch Interaction Task (Hess and Shipman)	15
(Rest)	(5)
ETS Spatial Egocentrism Task II	12
Preschool Embedded Figures Test	17
Motor Inhibition Test (Revised)	5
Battery B	
ETS Matched Pictures Language Comprehension Task II	5
Block Design (WPPSI)	10
Sigel Categorizing Test	17
Boy-Girl Identity Task	5
(Rest)	(5)
Massad Mimicry Test II (Revised)	15
Vigor 2 (Revised)	5
ETS Story Sequence Test III	12
Brown IDS Self-Concept Referents Test (Self and Teacher)	15
Battery C	
Spontaneous Numerical Correspondence and Conservation	10
Preschool Inventory (Caldwell)	20
Form Reproduction Task	5
Locus of Control Picture Story Test	10
(Rest)	(5)
Matching Familiar Figures Test II	10
Social Schemata	5
Picture Completion Test (WPPSI)	5
Auditory Discrimination Test (Wepman)	8
ETS Enumeration Task III	10
Risk-Taking 2	3

Portland and Trenton

Test Battery	Estimated Time (in minutes)
ETS Matched Pictures Language Comprehension Task II	5
Preschool Embedded Figures Test	17
Boy-Girl Identity Task	4
Matching Familiar Figures Test II	10
Sigel Categorizing Test	15
Motor Inhibition Test (Revised)	5
ETS Story Sequence Test III	12
ETS Enumeration Task III	10
Brown IDS Self-Concept Referents Test (Self and Teacher)	12

Note. Test Situation Ratings also were obtained for each battery.

Year 4 - Testing Sequence

Lee County and Portland

Battery A	Est. Time (In minutes)
Raven Colored Progressive Matrices	13
Naming Category Instances	15
Gumpgookies	14
Sticker Task (House)	8
(Rest)	(5)
ETS Spatial Egocentrism Task III	12
Children's Embedded Figures Test	15
Motor Inhibition Test (Revised)	5
Battery B	
ETS Test of Linguistic Structures	12
Block Design (WISC)	9
Sticker Task (Tree 1)	8
Sigel Categorizing Test	15
Boy-Girl Identity Task	4
(Rest)	(5)
Massad Mimicry Test II (Revised)	12
Auditory-Visual Integration	8
School Perception Interview	12
Sticker Task (Tree 2)	8
Battery C	
Spontaneous Numerical Correspondence and Conservation	10
Stanford Memory Test	8
Bender-Gestalt Test	10
Locus of Control Picture Story Test	10
(Rest)	(5)
Matching Familiar Figures Test III	9
Social Schemata	5
Picture Completion Test (WISC)	7
Auditory Discrimination (Wepman)	8
Brown IDS Self-Concept Referents Test (Self and Teacher)	15

Note. Test Situation Ratings also were obtained for each battery.

Year 4 - Testing Sequence

Trenton

Test Battery	Est. Time (In minutes)
Children's Embedded Figures Test	15
Boy-Girl Identity Task	4
Matching Familiar Figures Test	9
Sigel Categorizing Test	12
Motor Inhibition Test (Revised)	4
Raven Colored Progressive Matrices	13
School Perception Interview	12
Naming Category Instances	12
Brown IDS Self-Concept Referents Test (Self and Teacher)	15
Test Situation Ratings	--

Year 6 - Testing Sequence

Lee County, Portland, and Trenton

Battery A	Est. Time (In minutes)
ETS Spatial Egocentrism Task	10
Block Design (WISC)	9
Digit Span (WISC)	5
Sticker Task I (Revised)	5
Sigel Categorizing Test	12
Motor Inhibition Test	4
What Can You Use It For?	10
Picture Completion Test (WISC)	7
School Perception Interview	12
Children's Embedded Figures Test	15
Story Sequence Test IV	10
Sticker Task II (Revised)	5
Battery B	
Raven Colored Progressive Matrices	13
Naming Category Instances II	12
Bender-Gestalt Test	10
Stanford Memory Test - Short Term Series	8
Locus of Control Picture Story Test	10
Stanford Memory Test - Delay Series	4
Matching Familiar Figures Test IV	9
What Could It Be?	10
Auditory-Visual Integration Test	8
Self-Concept Referents Test (Self and Mother)	13

Note. Test Situation Ratings also were obtained by task and battery.

APPENDIX C

SUMMARY OF DATA COLLECTION ACTIVITIES

ETS-Head Start Longitudinal Study

Summary of Data Collection Activities

Lee County, Alabama	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6
Parent Interview	Home	Brief Ques.	Test Center			Home
Mother-1st Day of School Ques.	X		X			
Mother-Child Interaction Tasks	3		2			
Interaction Ratings	X		X			
Indiv. Child Tests	28	8	23	24		22
Test Situation Ratings			X	X		X
Gp. Test-Metropolitan			X			
Gp. Test-Gumpgookies		CS*	X	X**		
Gp. Test-Coop. Primary		CS*		X	X	X
Gp. Test-Thurstone Spatial Relat.						X
Gp. Test-Coopersmith						X
Human Figure Drawings			X	X		X
Personality Obs.						
Indiv. Pupil Obs.				6X		
PROSE						
Global Classroom Ratings			3X	4X	4X	4X
Teacher: Pupil Ratings			X	X	X	2X
Teacher: Enhancement of Lng.			X	X	X	X
Teacher Questionnaire		CS*	X	X	X	X
Teacher Aide Questionnaire			X			
Presch. Center Inventory			X			
School Inventory		CS*		X	X	X
Classroom Facilities Inventory				X	X	X
School Attendance			X	X	X	X
School Records				X	X	X
Community Questionnaire		X		X		X
Health Record	X					
Tester & Observer Questionnaire			X	X	X	X

*CS = cross-sectional sample

**Individual Gumpgookies administered

ETS-Head Start Longitudinal Study

Summary of Data Collection Activities

Portland, Oregon	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6
Parent Interview	Home	Test Center				Home
Mother-1st Day of School Ques.	X	X				
Mother-Child Interaction Tasks	3	1				
Interaction Ratings	X	X				
Indiv. Child Tests	28	32	9	24		22
Test Situation Ratings			X	X		X
Gp. Test-Metropolitan		CS*	X			
Gp. Test-Gumpgookies		CS*	X	X**		
Gp. Test-Coop. Primary		CS*		X	X	X
Gp. Test-Thurstone Spatial Relat.						X
Gp. Test-Coopersmith						X
Human Figure Drawings			X	X		X
Personality Obs.		X				
Indiv. Pupil Obs.						
PROSE		X				
Global Classroom Ratings		1-2X	2X	2X	3X	4X
Teacher: Pupil Ratings			X	X	X	2X
Teacher: Enhancement of Lng.		X	X	X	X	X
Teacher Questionnaire		X,CS*	X	X	X	X
Teacher Aide Questionnaire		X				
Presch. Center Inventory		X				
School Inventory		CS*		X	X	X
Classroom Facilities Inventory				X	X	X
School Attendance		X	X	X	X	X
School Records			X	X	X	X
Community Questionnaire		X		X		X
Health Record	X					
Tester & Observer Questionnaire		X	X	X	X	X

*CS = cross-sectional sample

**Individual Gumpgookies administered

ETS-Head Start Longitudinal Study

Summary of Data Collection Activities

Trenton, New Jersey	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6
Parent Interview	Home	Test Center				Home
Mother-1st Day of School Ques.	X	X				
Mother-Child Interaction Tasks	3	1				
Interaction Ratings	X	X				
Indiv. Child Tests	28	32	9	9		22
Test Situation Ratings			X	X		X
Gp. Test-Metropolitan		CS*	X			
Gp. Test-Gumpgookies		CS*	X	X		
Gp. Test-Coop. Primary		CS*		X	X	X
Gp. Test-Thurstone Spatial Relat.						X
Gp. Test-Coopersmith						X
Human Figure Drawings			X	X		X
Personality Obs.		X				
Indiv. Pupil Obs.						
PROSE		X				
Global Classroom Ratings		1-2X	2X	3X	3X	4X
Teacher: Pupil Ratings			X	X	X	2X
Teacher: Enhancement of Lng.		X	X	X	X	X
Teacher Questionnaire		X,CS*	X	X	X	X
Teacher Aide Questionnaire		X				
Presch. Center Inventory		X				
School Inventory		CS*		X	X	X
Classroom Facilities Inventory				X	X	X
School Attendance		X	X	X	X	X
School Records			X	X	X	X
Community Questionnaire		X		X		X
Health Record	X					
Tester & Observer Questionnaire		X	X	X		X

*CS = cross-sectional sample